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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,938	12/09/2003	Yoshitaka Iwaji	62807-140	2385

7590 06/07/2004

McDermott, Will & Emery
600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER	
MCCLOUD, RENATA D	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,938	IWAJI ET AL.	
	Examin r	Art Unit	
	Renata McCloud	2837	

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,11 and 13-15* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/09/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 10-15 are objected to because of the following informalities: The claims are objected to because they include reference characters which are not enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagayama (US 6,593,714).

Claim 10: A control apparatus, comprising a speed command generator (Fig. 1:9) for issuing a speed command (Fig. 1:w); an applied voltage calculation unit (Fig. 1:2,3,10,13,14,15) for calculating applied voltage; a PWM generator (Fig. 1:17); and a current detector (Fig. 1: 5,6), wherein: said applied voltage calculation unit (2,3,10,13,14,15) is responsive to detected current (iu, iv, iw) of said electric motor as detected by said current detector (5,6) and said speed command (w) issued by said speed command generator (9), and outputs a step-out discrimination signal (2 sends signal to 9) to said speed command generator (9) and a voltage command to said PWM generator (17), wherein said applied voltage calculation unit comprises: (a) a coordinate converter (14)for inputting and converting the detected current of said electric motor into components on a dc-qc-axis which is a rotational coordinate in a control of the detected current of said electric motor; and (b) a step-out detector (15) responsive to an absolute value of a frequency correction amount which is outputted by said coordinate converter (14) as a changed amount of current (deta Iu, delta Iv), for outputting said step-out discrimination signal if said absolute value exceeds a reference value (Fig. 4: S2, S3, S4, S5; Col. 7: 23-39).

Claim 11: applied voltage calculation unit further comprises an axis error calculation unit (10) for estimating and calculating an axis error between a phase of an alternate current referred to a magnetic pole axis of said electric motor and a practical phase of a magnetic pole axis of said electric motor (Col. 3:26-37), and an estimated axis error (Fig. 1:theta a) outputted by said axis error calculation unit is inputted to said step-out detector (15).

4. Claims 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakamoto et al (US 6,396,229).

Claim 10: A control apparatus, comprising a speed command generator (Fig. 1: frequency command) for issuing a speed command; an applied voltage calculation unit (Fig. 1:7,42,43,44,53-55,61,62) for calculating applied voltage; a PWM generator (Fig. 1:45); and a current detector (Fig. 1: 32), wherein: said applied voltage calculation unit (42,43,44,53-55) is responsive to detected current (iu, iw) of said electric motor as detected by said current detector (32) and said speed command issued by said speed command generator (frequency command), and outputs a step-out discrimination signal (omega r*) to said speed command generator (frequency command) and a voltage command to said PWM generator (45), wherein said applied voltage calculation unit comprises: (a) a coordinate converter (41) for inputting and converting the detected current of said electric motor into components on a dc-qc-axis; and (b) a step-out detector (7,61,62) responsive to an absolute value of a frequency correction amount which is outputted by said coordinate converter (41) as a changed amount of current (Col. 18:5-8), for outputting said step-out discrimination signal if said absolute value exceeds a reference value.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama (US 6,593,714).

Claim 13: Nagayama teaches a speed command generator (9), applied voltage calculation unit (2,3,10,13,14,15), the PWM generator (17), a current detector (9) and said inverter (4) and are provided within a common housing (Fig. 1). Nagayama teaches the claimed invention except for separating and arranging the parts on first and second circuit boards. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place arrange the parts on separate circuit boards since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Claim 14: a microprocessor (Col. 3: 60-61) is provided with said the abnormality detection unit, which is part of the voltage calculating unit.

Claim 15: A control apparatus, comprising a speed command generator (Fig. 1:9) for issuing a speed command (Fig. 1:w); an applied voltage calculation unit (Fig. 1:2,3,10,13,14,15) for calculating applied voltage; a PWM generator (Fig. 1:17) for generating a pulse width modulated wave; and a current detector (Fig. 1: 5,6) for detecting current of the electric motor, wherein: said applied voltage calculation unit

(2,3,10,13,14,15) is responsive to detected current (iu, iv, iw) of said electric motor as detected by said current detector (5,6) and said speed command (w) issued by said speed command generator (9), and outputs a step-out discrimination signal (2 sends signal to 9) to said speed command generator (9) and a voltage command to said PWM generator (17), wherein said applied voltage calculation unit comprises: (a) a coordinate converter (14)for inputting and converting the detected current of said electric motor into components on a dc-qc-axis which is a rotational coordinate in a control of the detected current of said electric motor; and (b) a step-out detector (15) responsive to an absolute value of a frequency correction amount which is outputted by said coordinate converter (14) as a changed amount of current (delta Iu, delta Iv), for outputting said step-out discrimination signal if said absolute value exceeds a reference value (Fig. 4: S2, S3, S4, S5; Col. 7: 23-39); a speed command generator (9), applied voltage calculation unit (2,3,10,13,14,15), the PWM generator (17), a current detector (9) and said inverter (4) and are provided within a common housing (Fig. 1). Nagayama teaches the claimed invention except for separating and arranging the parts on first and second circuit boards. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place arrange the parts on separate circuit boards since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Allowable Subject Matter

7. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and to overcome the claim objection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. They are: Nakayama et al (US 5,656,911), Masaki et al (US 6,555,988), Masaki et al (US 6,281,656), Notohara et al (US 6,075,328), Masaki et al (US 5,990,657), Sakakibara et al (US 5,903,128), Garces (US 5,850,132), Nishimura (US 6,275,000), Oguro et al (US 6,081,093), Kaneko et al (US 6,242,882), Kimura et al (US 5,739,650), Ide et al (US 6,242,885), Sakamoto et al (US 6,462,492), Koga et al (US 6,518,718), Iijima et al (US 6,462,491), and Seibel et al (US 5,965,995).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM

DAVID MARTIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800